UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

December 19, 2002

Tennessee Valley Authority
ATTN: Mr. J. A. Scalice
Chief Nuclear Officer and
Executive Vice President
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: SEQUOYAH NUCLEAR PLANT INDEPENDENT SPENT FUEL STORAGE INSTALLATION INSPECTION REPORT 72-34/2002-001 AND NOTICE OF VIOLATION

Dear Mr. Scalice:

On November 8, 2002, the Nuclear Regulatory Commission (NRC) completed an inspection of the Sequoyah Nuclear Plant Independent Spent Fuel Storage Installation (ISFSI) concrete storage pad design and construction activities. The enclosed inspection report presents the results of that inspection.

The conduct of construction activities for the ISFSI at the Sequoyah Nuclear Plant was generally characterized by appropriate engineering support. Based upon the results of this inspection, one violation was identified for an inadequate procedure, resulting in failure to use the correct air content acceptance criteria for storage pad concrete.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's Document system (ADAMS). ADAMS is accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Mark S. Lesser, Chief
Engineering Branch 2
Division of Reactor Safety

Docket No. 72-34
License No. General License

Enclosures: (See page 2)

Enclosures: 1. Notice of Violation
2. Inspection Report No. 72-34/2002-001 w/Attachment

cc w/encls:
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Sequoyah Nuclear Plant
Tennessee Valley Authority
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(cc w/encls cont'd - See page 3)

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NAME	RCHOU	WGLOERSEN	SCAHILL				
DATE	12/5/2002	12/5/2002	12/3/2002	12/ /2002	12/ /2002	12/ /2002	12/ /2002
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO
PUBLIC DOCUMENT	YES NO						

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NOTICE OF VIOLATION

Tennessee Valley Authority (TVA)
Sequoyah Nuclear Plant - Independent Spent Fuel Storage Installation

Docket No. 72-34
License No. General License

During an NRC inspection conducted from November 4 to 8, 2002, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedures for NRC Enforcement Actions," NUREG 1600, the violation is listed below:

> 10 CFR 72.150 requires in part that the licensee shall prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall require that these instructions, procedures, and drawings be followed.
>
> Tennessee Valley Authority General Engineering Specification G-2, Rev.7, Plain and Reinforced Concrete Appendix B, Ready-Mix Concrete for Small-Scale Concrete Work During Construction, Modification, and Repairs, specifies the air content of the concrete shall be four to seven percent.
>
> Modifications & Additions Instruction (M&AI) - 21, Concrete Placement and Repair, specifies the methods and guidelines for placement of concrete.
>
> Contrary to the above, on November 7, 2002, M&AI-21, Concrete Placement and Repair, Revision 7, was not appropriate to the circumstances, in that it was not adequate to ensure concrete air content was four to seven percent. As a result, the licensee applied an incorrect acceptance criteria of four and half to eight percent and accepted concrete with rejectable air content.

This is a Severity Level IV violation (Supplement VI).

Pursuant to the provisions of 10 CFR 2.201,Tennessee Valley Authority is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555, with a copy to the Regional Administrator, Region II, and a copy to the NRC Resident Inspector, Sequoyah Nuclear Plant, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation; (2) the corrective steps that will be taken and the results achieved; (3) the corrective steps that have been taken to avoid further violations; and (4) the date when full compliance will be achieved. Your response may reference or include previous docketed correspondence, if the correspondence adequately addresses the required response. If an adequate reply is not received within the time specified in this Notice, an Order or a Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

If you contest this enforcement action, you should also provide a copy of your response to the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

Because your response will be placed in the NRC Public Document Room (PDR), to the extent possible, it should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the PDR without redaction. If personal privacy or proprietary information is necessary to provide an acceptable response, then please provide a bracketed copy of your response that identifies the information that should be protected and a redacted copy of your response that deletes such information. If you request withholding of such material, you must specifically identify the portions of your response that you seek to have withheld and provide in detail the bases for your claim of withholding (e.g., explain why the disclosure of information will create an unwarranted invasion of personal privacy or provide the information required by 10 CFR 2.790(b) to support a request for withholding confidential commercial or financial information). If safeguards information is necessary to provide an acceptable response, please provide the level of protection described in 10 CFR 73.21.

Dated at Atlanta, Georgia
this 19 day of December 2002

U.S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No:	72-34
License No:	General License
Report No:	72-34/2002-001
Licensee:	Tennessee Valley Authority
Facility:	Sequoyah Nuclear Plant Independent Spent Fuel Storage Installation
Location:	Sequoyah Access Road Soddy-Daisy, TN 37379
Dates:	November 4 - 8, 2002
Inspector:	Rich C. Chou, Reactor Inspector
Approved by:	M. Lesser, Chief, Engineering Branch 2 Division of Reactor Safety

Enclosure 2

EXECUTIVE SUMMARY

Sequoyah Nuclear Plant
Independent Spent Fuel Storage Installation
NRC Inspection Report 72-34/2002-001

This inspection consisted of observation and review of licensee activities associated with spent fuel cask storage pad design and construction. One violation was identified for an inadequate procedure resulting in the failure to use the correct acceptance criteria for air content in concrete.

Attachment:
Partial List of Persons Contacted
Inspection Procedures Used
List of Items Opened, Closed and Discussed
Documents Reviewed
List of Acronyms

Report Details

1. **Review of Independent Spent Fuel Storage Installation (ISFSI) Cask Storage Pad Design**

a. Inspection Scope (60856)

The inspector reviewed ISFSI cask storage pad design calculations and related documents. The calculations and documents included design change notice, structural qualification, soil and bearing test, and design methodology. The TVA design calculations that documented the acceptance of Holtec International's (vendor) three design reports were reviewed. The inspector verified the Holtec design calculations for concrete, yield strength and spacing of rebar, and pad thickness as shown in the Design Drawing No. 3492, Sheet 9. The review included soil layer information, soil testing and soil structure interaction analysis reports, soil liquefaction analyses, site design seismic acceleration, friction coefficient between the cask bottom and the surface of concrete, static and dynamic load analyses, load combinations for various loading conditions, design of rebars, pad settlements, and acceptability of the pad design. The inspector verified that the load combinations for the pad design were based on the American Concrete Institute (ACI) code.

b. Observations and Findings

No findings of significance were identified.

2. **Review of Cask Storage Pad Section No. 1 Construction and Other Modifications For ISFSI**

a. Inspection Scope (60853)

The inspector reviewed construction and modification activities of Cask Storage Pad Section No. 1, Cask Fabrication Pad, Cask Loading Crane, and Roadways which were associated with the ISFSI. The inspector observed the excavation of the cask fabrication pad, wiring and new drum replacement for the cask loading crane, and the pavement installation of the cask route roadway modification.

The inspector examined the rebar installation and observed the concrete pour for the Cask Storage Pad Section No. 1. The inspector verified the rebar size, spacing, splice length, brick supporting chair, and the concrete coverage protection on the top, side, and bottom. The inspector evaluated concrete formwork installation including depth, straightness, edge angle steel installation for crash protection, and horizontal bracing. The inspector also verified the overall dimensions, orientation, levelness, and slope for drainage purpose as required by the drawings. The inspector reviewed batch tickets for the materials and mixing time before the pour and observed concrete placement, vibration, and finish. The inspector observed the slump test, air content test, temperature measurement, and cylinder samples collected for compression tests. The inspector also reviewed the licensee examiners' reports for prepour inspection and concrete pour record. The inspector reviewed the specification, procedure, and 50.59 screen review and evaluation for Design Change Notice (DCN) D-20922. The inspector compared the observation results to the project construction specification; the design drawings; and standards, codes, and criteria of the ACI and the American Society for Testing and Materials (ASTM).

b. Observations and Findings

On November 7, 2002, the inspector identified that the licensee failed to use the correct acceptance criteria for air content in concrete of four to seven percent and instead used four and half to eight percent.

Appendix B, Ready-Mix Concrete for Small-Scale Concrete Work During Construction, Modification, and Repairs, of TVA General Engineering Specification G-2, Rev.7, Plain and Reinforced Concrete requires the air content of the concrete to be four to seven percent. During the air content testing for concrete samples, the licensee used acceptance criteria of four and half to eight percent for severe exposure condition based on the maximum aggregate of 3/4 inch for the Commercial Patching Concrete from Appendix D, Concrete Slump and Air Content Requirements of TVA Sequoyah Nuclear Plant Modification & Additions Instruction (M&AI) -21, Concrete Placement and Repair, Revision 7, Quality Related. The licensee indicated that the procedure should have referred back to TVA General Engineering Specification G-2 for the correct acceptance criteria. The inspector determined that M&AI-21 was not adequately written to ensure the correct acceptance criteria was applied. The use of incorrect air content acceptance criteria allowed rejectable concrete to be used for the cask storage pad and potentially affected the quality of the pad. This is identified as an inadequate procedure and a violation of 10 CFR 72.150, which states in part that the licensee shall prescribe activities affecting quality by documented instructions, procedures, or drawings of a type appropriate to the circumstances. (Violation 72-34/2002-001-01 Inadequate Procedure to Use the Correct Air Content Acceptance Criteria for Concrete)

The inspector noted that the licensee collected concrete samples from the chute discharge of the mixing truck instead of the pump line discharge. The air content will be different after passing through the pump line. Following identification of this concern, the licensee measured a difference of 2%. Section 4.8 of ANSI N45.2.5 - 1974, Supplementary Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete and Structural Steel During the Construction Phase of Nuclear Power Plants, stipulates in part that pumped concrete be sampled from the pump line discharge. Review of the licensee's Quality Assurance Program indicated that alternative criteria, to that specified in ANSI N45.2.5 - 1974, was used for concrete construction. The alternative criteria was specified in TVA General Engineering Specification G-2 and did not require sampling from the pump line discharge. It was therefore not clear that sampling from the pump line discharge was a requirement by the licensee's Quality Assurance Program.

The licensee issued Problem Evaluation Reports (PER) to address the problems and develop corrective actions.

c. Conclusion

One violation was identified for an Inadequate Procedure to Use the Correct Air Content Acceptance Criteria for Concrete.

3. Management Meetings

The inspection scope and results were summarized and discussed with the licensee on November 8, 2002 and via telephone with Pedro Salas, Licensing and Industry Affairs Manager, Sequoyah Nuclear Plant, of the licensee on November 15, 2002. A partial list of licensee persons contacted during this inspection is indicated in the Attachment. Proprietary information is not contained in this report.

1. PARTIAL LIST OF PERSONS CONTACTED

Licensee Personnel

P. Bevil, ISFSI Quality Manager
J. Casey, Modifications Superintendent
R. Chapman, BFN ISFSI Project Manager
C. Davis, Manager of Projects, ISFSI
M. Lorek, Assistant Plant Manager
R. Marks, Manager of Projects, BFN
P. Osborne, Civil Engineering Manager
P. Salas, Licensing Manager

NRC

N. Garnett, Sequoyah Acting Senior Resident Inspector
R. Telson, Sequoyah Resident Inspector

2. INSPECTION PROCEDURES USED

IP 60856 Review of 10 CFR 72.212(b) Evaluation (Appendix A only)
IP 60853 On-Site Fabrication of Components and Construction of An ISFSI

3. LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Status	Description
VIO 72-34/2002-001-01	Open	Inadequate Procedure to Use the Correct Air Content Acceptance Criteria for Concrete (Section 2.b).

4. DOCUMENTS REVIEWED

Procedures and Specification

- TVA General Engineering Specification G-2, Revision 7, Plain and Reinforced Concrete
- TVA Sequoyah Nuclear Plant Modifications & Additions Instruction M&AI-21, Revision 7, Concrete Placement and Repair, Quality Related.

Miscellaneous Documents

- Design Change Notice (or Request) (DCN) D-20922, Revision A, Design/Procurement and Construction of ISFSI Pad, Fabrication Pad, and Roadways
- Calculation No. SCG1S617, Revision 0, Methodology for the ISFSI Pad/Cask Assemblage Including SSI (This Calculation is to Document Holtec Reports HI-2012689, Methodology for the Independent Spent Fuel Storage Installation (ISFSI) Pad/Cask Assemblage Including Soil Structure Interaction (SSI) and HI-2012727, SSI Analysis for Sequoyah ISFSI Pad.)

Attachment

- Calculation No. SCG1S618, Revision 0, Structural Qualification of Sequoyah Nuclear Plant ISFSI Pad (This Calculation is to Document Holtec Report No. HI-2012728, Structural Qualification of Sequoyah Nuclear Plant Independent Spent Fuel Storage Installation (ISFSI) Pad.)

- Calculation No. SCG1S619, Revision 0, Documentation Relating to Report of Soils Testing for Independent Spent Fuel Storage Installation at Sequoyah.

- Drawing No. 3492, Sheet 9, Revision 4, Cask Storage Pad - Concrete.

- Concrete Cylinder Report for Lab Nos. 1 to 6

- Concrete Placement and Repair , Preplacement Data Sheet 1 & 2 of Appendix A of M&AI - 21

- Problem Evaluation Reports (PERs)

5. LIST OF ACRONYMS

CFR	Code of Federal Regulations
TVA	Tennessee Valley Authority
DCN	Design Change Notice
ISFSI	Independent Spent Fuel Storage Installation
NRC	Nuclear Regulatory Commission
PER	Problem Evaluation Report
SFPO	Spent Fuel Project Office
ACI	American Concrete Institute
ASTM	American Society for Testing and Materials
CoC	Certificate of Compliance